



Syracuse University Environmental Health and Safety Services

Guidance Document for Selection, Siting and Installation of Emergency Wash Equipment

This guidance document was developed to assist affected Syracuse University Departments in properly selecting, siting and installing emergency wash equipment at the University. It is essential that emergency wash equipment be selected, sited and installed properly to meet applicable regulatory requirements and provide unhindered, ready access to the equipment in the event of a hazardous materials emergency. The information provided in this document is derived from current regulatory standards, accepted best practices, and professional recommendations from EHSS staff.

I. Regulatory Standards

The Occupational Safety and Health Administration's (OSHA) Standard for Medical Services and First Aid (29 CFR 1910.151) requires "where the eye and body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing shall be provided within the work area for immediate use". OSHA has not set prescribed specifications for emergency wash equipment, but upholds that if the equipment complies with the American National Standard Institute's Standard for Emergency Eyewash and Shower Stations (ANSI Z358.1), it should meet the intent of the OSHA standard.

II. Emergency Wash Equipment Definitions

- **Emergency Eyewash (Eye/Face Wash):** Eyewash stations are designed to flush the eye and face area only. Eyewashes are typically installed in areas where there is a potential risk for an eye and/or face exposure from a corrosive chemical or other hazardous material.
- **Emergency Shower:** Emergency showers are designed to flush the users head and body. They should not be used to flush the eyes because of their high rate of water flow and pressure. Emergency showers are typically installed in areas where there is a potential risk for body exposure to a corrosive chemical or other hazardous material.
- **Combination Eyewash/Shower:** Combination units provide the ability to flush the entire body including the eyes. Combination units are preferred for installation when there is a potential risk for body and eye exposure to a corrosive chemical or other hazardous material.
- **Corrosive Material:** OSHA defines a corrosive material to be a chemical that causes visible destruction of or irreversible alterations in, living tissue by chemical action at the site of contact. Generally speaking, corrosive materials have a very low pH (acids) or a very high pH (bases).
- **Flushing Fluid:** Flushing fluids may include any potable water, preserved water, buffered saline solution or other medically acceptable solutions.
- **Hazardous Material:** A hazardous material is any agent (chemical, radiological, biological or physical) that has the potential to cause a physical or health hazard.
- **Drench Hose:** Drench hoses are supplemental wash equipment that allow for spot washing small areas of the body. Drench hoses are not required, but can be a beneficial addition to supplement an area's required emergency wash equipment, especially in high chemical use areas such as laboratories. A drench hose can never be installed in place of an emergency shower. A drench hose may be installed in place of an eyewash, but only if the drench hose meets the ANSI performance requirements for an eyewash.
- **Personal Eyewash:** A personal eyewash is typically an eyewash bottle. It does not meet the ANSI requirement to provide at least a 15-minute flush, but can provide flushing while in route to an eyewash or medical facility. Personal eyewashes have an expiration date and must be periodically inspected.

III. Locations Requiring Emergency Wash Equipment

The need for an eyewash in a specific work area will depend on the material(s) used and the operation(s) performed in the work area. The OSHA standard requires emergency wash equipment in work areas where corrosive materials are used. ANSI expands the need for emergency wash equipment to areas where persons are exposed to corrosive or other hazardous materials that are capable of producing adverse effects on the health and safety of humans. Aligning with these standards and accepted best practices, the following table provides general guidelines for where emergency wash equipment would be required or recommended. In many cases, a work area specific review may be warranted to determine if emergency wash equipment is needed. EHSS can assist in performing work area reviews and emergency wash equipment needs determinations.

Examples of Required/Recommended Emergency Wash Locations

Work Area Description	Eye Wash	Shower
Laboratory - Chemical Use	Required	Required
Laboratory - Radiological Use	Required	Required
Laboratory - Biological Use	Required	Required
Areas processing clinical samples (blood, tissue, urine, etc.)	Required	Recommended* <i>*If the volume and method of use present a potential risk for body exposure</i>
Work areas where CORROSIVE materials ARE used in a manner that could results in exposure to eye and/or body.	Required	Required* <i>*If the volume and method of use present a potential risk for body exposure</i>
Work areas where NON-CORROSIVE hazardous materials ARE used (solvents, paints, etc.) in a manner that could result in an exposure to the eye and/or body.	Recommended	Recommended* <i>*If the volume and method of use present a potential risk for body exposure</i>
Workshops (wood, machine, art, etc.) where CORROSIVE materials ARE used in a manner that could results in exposure to eye and/or body.	Required	Required* <i>*If the volume and method of use present a potential risk for body exposure</i>
Workshops (wood, machine, art, etc.) where NON-CORROSIVE hazardous materials ARE used (cutting fluids, solvents, paints, etc.) in a manner that could result in an exposure to the eye and/or body.	Required	Recommended* <i>*If the volume and method of use present a potential risk for body exposure</i>
Pesticide Storage Areas	Recommended* <i>*Required if corrosive pesticides are stored</i>	Recommended* <i>*Required if corrosive pesticides are present and the volume and method of their use presents a potential risk for body exposure</i>
Battery Servicing Areas (service beyond charging)	Required	Required

- Mobile Work Areas:** For mobile or remote work areas, including the multiple locations custodial and maintenance staff may work in throughout the University, use of corrosive materials should be eliminated if feasible. If not feasible, provisions for emergency wash equipment should be made. OSHA does not prescribe alternative solutions for emergency wash equipment in mobile work areas. However, since providing fully compliant emergency wash equipment for every possible mobile work area at the University is not practical, best effort alternative wash provisions should be provided. Suggestions for alternative emergency wash provisions could include a personal eyewash, a publically accessible emergency wash station within the building, or a non-publically accessible emergency wash station in the building to which the user of the corrosive material has access to.
- New Building Construction and Major Building Renovations:** It is recommended that at least one eyewash be installed in a publically accessible area in new University buildings or any buildings undergoing major renovations. A preferable location would be near the custodial storage closet, if feasible. An eyewash is recommended even if planned or current operations in the building do not involve the use of corrosive materials.

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IV. General Emergency Wash Equipment Installation Requirements

Emergency wash equipment must be installed in accordance with the most current ANSI Z358.1 standard. EHSS should be consulted prior to installation of emergency wash equipment at the University, to assist with verifying proper placement. The following provides a summary of the major ANSI Z358.1 (2014) requirements and recommended best practices for the general installation of emergency wash equipment. In addition, there are specific installation requirements for each type of emergency wash equipment as described in sections V, VI and VII of this guidance document.

- a. Emergency wash equipment should be available for immediate use, but in no instance should it take an individual longer than **10 seconds** (approximately 55 feet) to reach the nearest station.
- b. The equipment must be located on the same level as the hazard (e.g. accessing the equipment should not require going up or down stairs or ramps).
- c. The path of travel from the hazard to the emergency wash equipment must be accessible, free of obstructions and as straight as possible. Installation should also consider other potential hazards that may be adjacent to the path of travel that might cause further injury.
- d. Access to the emergency wash equipment should not require an individual to pass through a door. If no corrosives are present in the work area, access to the wash equipment through one door is allowed as long as the door is unlocked, the door opens in the direction of travel to the emergency wash equipment, and the emergency wash equipment can be reached within 10 seconds.
- e. The equipment must be identified with a highly visible sign positioned so the sign is visible within the area served by the wash equipment. The area must be well lit.
- f. The equipment must be certified by the manufacturer as meeting the most recent edition of ANSI Z358.1.
- g. The equipment must be connected to a system capable of supplying tepid (60-100 °F) flushing fluid. EHSS recommends the equipment be plumbed to the potable water system with the temperature set at 85 °F.
- h. The equipment must be installed to meet applicable plumbing codes.
- i. EHSS must be contacted following the installation of emergency wash equipment to test the equipment and verify its function aligns with ANSI Z358.1.

Please refer to the most recent version of the ANSI Z358.1 standard for a complete list of requirements.

V. Specific Eyewash (and Eye/Face Wash) Installation Requirements

Emergency wash equipment must be installed in accordance with the current ANSI Z358.1 standard. The following provides a summary of the major ANSI Z358.1 (2014) requirements and recommended best practices specific to emergency eyewash (and eye/face wash) equipment. These requirements are in addition to the general installation requirements discussed in Section IV.

- a. Eyewash must be installed so that contact with the flushing fluid would be between 33 inches (83.8 cm) and 53 inches (134.6 cm) from the floor. The flushing fluid must also be at least six inches (15.4 cm) from a wall or nearest obstruction. If mounted on a counter, the installation should minimize flooding during operation (e.g. swing arm style mounted adjacent to a sink).
- b. If it is an eyewash only, it must be capable of delivering flushing fluid at not less than 0.4 gallons (1.5 liters) per minute for 15 minutes. If it is an eye/face wash, it must be capable of delivering flushing fluid at not less than 3.0 gallons (11.4 liters) per minute for 15 minutes.
- c. Eyewash must be designed to ensure that a controlled, low velocity flow of flushing fluid is provided evenly to both eyes and face (if it is an eye/face wash) simultaneously and is not injurious to the user.
- d. Eyewash nozzles must be protected from airborne contaminants and the removal of such protection must not require a separate motion by the operator when activating the unit.
- e. Eyewash must be designed to provide enough room to allow the eyelids to be held open with the hands while the eyes are in the flushing stream.
- f. The ANSI standard does not include any specific provisions for the disposal of wastewater from emergency wash equipment. As a best management practice, it is recommended that eyewashes be plumbed to drain to the building's sanitary sewer to prevent flooding and slip hazards during emergency and testing activations. If the eyewash is installed over a sink, the sink drain can serve as the eyewash drain.

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Please refer to the most recent version of the ANSI Z358.1 standard for a complete list of requirements.

VI. Specific Emergency Shower Installation Requirements

Emergency wash equipment must be installed in accordance with the current ANSI Z358.1 standard. The following provides a summary of the major ANSI Z358.1 (2014) requirements and recommended best practices specific to emergency showers. These requirements are in addition to the general installation requirements discussed in Section IV.

- a. Emergency shower must be capable of delivering flushing fluid at a minimum of 20.0 gallons per minute for 15 minutes (75.7 liters per minute).
- b. EHSS recommends that emergency showers have a privacy curtain or enclosure which contains disposable covering/clothing that the user can don after using the emergency shower. If installed, shower enclosure must have a minimum diameter of 34 inches (86.4 cm).
- c. EHSS recommends that at a minimum, an area of approximately 20 inches (50.8 cm) in all directions around the shower be kept clear and unobstructed.
- d. It is standard practice at the University to connect emergency showers into the University's alarm management system. When an emergency shower is activated, the alarm management system should activate an alarm that notifies the 24-Hour Energy Management Operations Center and the Department of Public Safety.
- e. The ANSI standard does not include any specific provisions for the disposal of wastewater from emergency wash equipment. Due to the large water volume, water pattern and location of emergency showers, it is difficult to confine and drain emergency shower wastewater. Emergency showers are generally not directly connected to a drain. Typically, area floor drains are used to drain the wastewater generated during a shower activation.

Please refer to the most recent version of the ANSI Z358.1 standard for a complete list of requirements.

VII. Specific Drench Hose Installation Requirements

A drench hose may be installed as supplemental emergency wash equipment to allow for spot washing small areas of the body. Drench hoses are not required, but can be a beneficial addition to supplement an area's required emergency wash equipment, especially in high chemical use areas such as laboratories. A drench hose may be installed:

- to supplement a work area's emergency shower by providing an alternative option for spot rinsing in lieu of activating the emergency shower.
- in a work area where installation of an emergency shower is not required.
- in place of an eyewash if the drench hose meets the ANSI performance requirements for an eyewash.

The following provides a summary of the major ANSI Z358.1 (2014) requirements for drench hoses installed as supplemental emergency wash equipment and recommended best practices specific to drench hoses. These requirements are in addition to the general installation requirements discussed in Section IV.

- a. Drench hoses must be designed to provide a controlled flow of flushing fluid to a portion of the body at a velocity low enough to be non-injurious to the user.
- b. If the drench hose is to be installed in place of an eyewash, it must meet the ANSI performance requirements for an eyewash.
- c. EHSS recommends drench hoses be installed in addition to the eyewash and emergency shower in high chemical use areas (i.e. laboratories), when feasible.